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Department of the Army
Office of the Chief of Ordnance

Miss Anderson/dg/54091
28 Mar 60

FROM: Subcommittee on Guided Missiles

TO: The Ordnance Technical Committee

SUBJECT: SQUIB, ELECTRIC: M3 k- Type Classification as Standard A (STB-A)

1. Ref:

- a. OTCM 36599, 8 Aug 57, recording nomenclature of subject component.
- b. Proposed Military Specification for manufacture and assembly of SQUIB, ELECTRIC, XM3 (OML-PD-113C, 17 Feb 60.).
- c. Ltr fr ARGMA (ORDXR-OP, 11 Mar 60, 00/40-UI 2233) requesting type classification of subject component.

2. Discussion:

a. Commercial and military squibs of possible application to rockets and guided missiles, have been studied to determine their surveillance characteristics, operating characteristics, and operational hazards. All of the squibs tested were found to have limited application because of one or more of the following reasons:

- Poor moisture resistance
- Little or no resistance to chemical attacks by vapors produced by composite or double-base propellants
- Poor temperature stability
- Long and erratic functioning times
- Nonfunctioning at high altitudes
- Inability to ignite various metals
- Static electricity hazards
- Inability to withstand rough handling
- High brisance
- Ejection of high velocity debris
- Poor geometric design.

In order to circumvent these shortcomings, a program was initiated to develop an army squib suitable for use with any solid propellant (composite or double base) in a large variety of applications.

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By systematically evaluating each component under adverse environmental conditions, selection of the most promising component was made and formulated the resultant inert components making up the XM3 squib. As far as is known the XM3 is unique in the application of an insulating liner for increasing a squib resistance to static sensitivity (reduced the static hazard), and A.C. voltage sensitivity. Over 35,000 developmental and production XM3 squibs have been made without a single miss fire.

b. Pertinent data required by Para 5g, AR 705-6, 3 Nov 58 for type classification is as follows (para designations correspond to requirements of AR):

(1) Pertinent Data.

(a) Description and Purpose: This item is designed for electrical firing of burning type munitions. It consists essentially of a tube containing a flammable material, and a small charge of powder compressed around a fine resistance wire connected to electrical leads or terminals. It has nylon insulated copper lead wires imbedded in a phenolic plug and bridged with a 1.0 mil platinum alloy bridge wire. Surrounding the bridge wire is a bead of zirconium metal fuel and inorganic oxidizer. A conductive graphite coating painted around the bead increased its resistance to static electricity. Attached to the plug is a spacer ring which contains the main powder charge of metal fuels and inorganic oxidizers. An aluminum case is crimped over the spacer and plug, and is insulated from the main powder charge with a thin dielectric film.

The M3 squib is used as standard equipment or on an experimental basis in the following rocket motors: NIKE Booster M5 (High Altitude and Standard), HONEST JOHN, HAWK, NIKE HERCULES Sustainer, JUPITER Spin Rocket, LITTLEJOHN, LITTLEJOHN Spin Rocket, FALCON, SPARROW III, T214 Aircraft Rocket, POLARIS Test Vehicle, MINUTE MAN, AUTOMET, and Experimental Liquid Fueled Engine. (The LITTLEJOHN, and LITTLEJOHN Spin Rocket are specified for R&D Rounds).

In view of the added safety, and improved storage properties, and functioning characteristics, it is desired to type classify the squib as Std A so that it may be incorporated into research and development and production items which use a nominally one ohm squib of these dimensions.

(b) Item name is in accordance with the current Fed Catalog system.

(c) Using agencies are the US Army, US Navy, and US Air Force.

(d) Item has been assigned to Fed Supply Class 1375, and is the logistics responsibility of the Ord Corps.

- (e) User test not required.
- (f) Stock status; World Wide and CONUS assets are limited.
- (g) Est current cost: \$1.50 ea in lots of less than 100,000.
\$0.50 each in lots of 1,000,000 or more.
- (h) Total number of units procured in the current fiscal year and the 2 preceding FYs. and on outstanding contracts: 35,000.
- (i) The item is intended for immediate and future procurement.
- (j) Training, operational and maintenance literature for the item is not required.
- (k) Material required to manufacture the item which might be unavailable under mobilization conditions: None
- (l) This action will not cause new or substantially increased use of materials likely to be short under current or wartime conditions.
- (m) Initial basis of issue is unknown.
- (n) Consumption rate for this expendable item is unknown.
- (o) No security classification is assigned to this item, the nomenclature, and this action.

c. Provisions of para 5h, AR 705-6 have been complied with, as applicable.

3. Recommendations:

The Subcommittee recommends that:

- a. SQUIB, ELECTRIC: XM3 be type classified Std A, and that it be assigned the nomenclature: SQUIB, ELECTRIC: M3.
- b. Fed Stock Nr be assigned when available.
- c. This item replaces SQUIB, ELECTRIC: M1A1, M2, and most squibs included in guided missiles. All retrofits will utilize SQUIB, ELECTRIC: M3.
- d. This materiel, info pertaining thereto, and this report be UNCL.

SUBMITTED FOR CONSIDERATION:

/s/ EDWARD HAYES
for /t/ B. J. LEON HERSHORN
Colonel, Ord Corps
Chairman, Subcommittee